UNIVERSITI TEKNOLOGI MARA

INVESTIGATION ON ROBOTIC GAS METAL ARC WELDING QUALITY FOR SPECIFIC SHIP PANEL STRUCTURE

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of the requirements for the degree of
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AUTHOR'S DECLERATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulation for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Robotic Welding (RW) is an ideal welding method to produce airtight joint. Many parameters affect the RW quality as welding current, welding voltage, travel speed, width of weaving, torch angle, width plate, clamping position and time gaps between passed. Welding input parameters play very significant role in determining the quality of a weld formation. This parameter is applied on v-butt joint and t-fillet joint with plate thickness 4mm, 6mm and 9mm. This project is to study the Design of Experiment (DoE) which can approach the optimization of parameter design. Functions for DoE can help to create and test practical plans to gather data for statistical modelling. DoE is structured, organized method that is used to determine the relationship between the different factor (Xs) affecting a process and the output of process (Y). DoE involve designing a series of experiments, in which all relevant factors are varied systematically. When the result of these experiments are analyzed, they help to identify optimal conditions, the factors that most influence the result, those that do not, as well as details such as the existence of interactions and synergies between factors. The average percentage error for plate thickness 9 mm butt joint by using Fractional Factorial Desing is 10.049 %. The optimum parameter would be utilized to develop Welding Procedure Specification (WPS). As the final objective, the development of WPS in this project will be applied to ship panel.

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